

## WHAT IS CLAIMED IS:

1           1.     An optical signal receiving system in which a  
2     receiving signal light which is transmitted through a  
3     single mode fiber having a zero-velocity-dispersion  
4     wavelength and has a wavelength different from the zero-  
5     dispersion wavelength, is received while performing  
6     dispersion compensation on the signal light, said system  
7     comprising:

8           optical receiving means; and  
9           automatic optical level adjustment means for  
10    automatically adjusting always to a predetermined level the  
11    level of optical signal to be received by said optical  
12    receiving means when the amount of dispersion compensation  
13    on the signal light is newly set.

1           2.     A system according to claim 1, wherein said  
2     optical signal is a wavelength-multiplexed optical signal;  
3     a plurality of said light receiving means is provided; and  
4     said automatic optical level adjustment means is provided  
5     in combination with each of the plurality of said light  
6     receiving means.

1           3.     A system according to claim 1, wherein said  
2     predetermined level is of an optimum light receiving level  
3     of said light receiving means.

1           4.     An automatic optical level adjuster for

2 automatically adjusting always to a predetermined level the  
3 level of a signal to be received by light receiving means,  
4 said adjuster comprising:

5 a variable optical attenuator for changing the amount  
6 of attenuation of light on the basis of first control  
7 information;

8 a variable optical amplifier for variably producing  
9 an optical output according to second control information;

10 optical switch means for switching on the basis of  
11 third information between an output optical path for output  
12 of input light by transmission through said variable  
13 optical attenuator and an output optical path for output of  
14 input light by transmission through said variable optical  
15 amplifier; and

16 control means for controlling the level of light  
17 output from each of said output optical paths to a preset  
18 level by outputting the third control information from  
19 comparison information obtained by comparing the level of  
20 the input light with a preset level, and the first or  
21 second control information from comparison information  
22 obtained by comparing the level of light output from said  
23 output optical path with a preset level.

1 5. An adjuster according to claim 4, wherein the  
2 level preset with respect to the input light and the level  
3 preset with respect to the light are stored in said control  
4 means.

1           6.     An adjuster according to claim 4, wherein the  
2 level preset with respect to the input light and the level  
3 preset with respect to the light are set from the outside  
4 of said adjuster.

1           7.     An adjuster according to claim 4, wherein said  
2 optical switch means comprises:  
3           a one-input two-output optical switch for selectively  
4 inputting the input light to said variable optical  
5 attenuator or said variable optical amplifier; and  
6           an optical coupler for combining the output of said  
7 variable optical attenuator and the output of said variable  
8 optical amplifier into one output.

1           8.     An adjuster according to claim 4, wherein said  
2 optical switch means comprises:  
3           a one-input two-output optical switch for selectively  
4 inputting the input light to said variable optical  
5 attenuator or said variable optical amplifier; and  
6           a two-output one-input optical switch for selectively  
7 establishing a connection for obtaining one output from the  
8 output of said variable optical attenuator and the output  
9 of said variable optical amplifier.

1           9.     An adjuster according to claim 4, wherein said  
2 optical switch means comprises:  
3           a one-input two-output optical branching device for

4 simultaneously inputting the input light to said variable  
5 optical attenuator and to said variable optical amplifier;  
6 and  
7 a two-output one-input optical switch for selectively  
8 establishing a connection for obtaining one output from the  
9 output of said variable optical attenuator and the output  
10 of said variable optical amplifier.

1 10. A system according to claim 1, wherein said  
2 automatic optical level adjustment means comprises:  
3 a variable optical attenuator for changing the amount  
4 of attenuation of light on the basis of first control  
5 information;  
6 a variable optical amplifier for variably producing  
7 an optical output according to second control information;  
8 optical switch means for switching on the basis of  
9 third information between an output optical path for output  
10 of input light by transmission through said variable  
11 optical attenuator and an output optical path for output of  
12 input light by transmission through said variable optical  
13 amplifier; and  
14 control means for controlling the level of light  
15 output from each of said output optical paths to a preset  
16 level by outputting the third control information from  
17 comparison information obtained by comparing the level of  
18 the input light with a preset level, and the first or  
19 second control information from comparison information  
20 obtained by comparing the level of light output from said

21 output optical path with a preset level.

1 11. A system according to claim 2, further  
2 comprising dispersion-compensating light receiving means  
3 forming a plurality of stages, said dispersion-compensating  
4 light receiving means comprising:

5 dispersion compensation means for performing  
6 dispersion compensation on the wavelength-multiplexed input  
7 signal light;

8 said automatic optical level adjustment means through  
9 which output light from said dispersion compensation means  
10 is transmitted;

11 wavelength demultiplexing means for separating output  
12 light from said automatic optical level adjustment means  
13 into first light which is signal light of a particular  
14 wavelength and second light left after removal of the first  
15 light; and

16 said light receiving means for receiving the first  
17 light,

18 wherein said dispersion-compensating light receiving  
19 means in the plurality of stages are connected in cascade  
20 form such that the second light in one of the stages is  
21 supplied as the input signal light to said dispersion  
22 compensation means in the following stage.

1 12. A system according to claim 11, wherein said  
2 wavelength demultiplexing means comprises a fiber grating  
3 for reflecting the first light, and an optical circulator.

1           13.    A system according to claim 12, wherein said  
2   optical circulator has three terminals.

1           14.    A system according to claim 2, further  
2   comprising dispersion-compensating light receiving means  
3   forming a plurality of stages, said dispersion-compensating  
4   light receiving means comprising:

5           dispersion compensation means for performing  
6   dispersion compensation on the wavelength-multiplexed input  
7   signal light;

8           wavelength demultiplexing means for separating output  
9   light from said dispersion compensation means into first  
10   light which is signal light of a particular wavelength and  
11   second light left after removal of the first light;

12          said automatic optical level adjustment means through  
13   which the first light is transmitted; and

14          said light receiving means for receiving the light  
15   transmitted through said automatic optical level adjustment  
16   means,

17          wherein said dispersion-compensating light receiving  
18   means in the plurality of stages are connected in cascade  
19   form such that the second light in one of the stages is  
20   supplied as the input signal light to said dispersion  
21   compensation means in the following stage.

1           15.    A system according to claim 14, wherein said  
2   wavelength demultiplexing means comprises a fiber grating

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3 for reflecting the first light, and an optical circulator.

1 16. A system according to claim 15, wherein said  
2 optical circulator has three terminals.

1 17. A system according to claim 2, further  
2 comprising:

3 wavelength demultiplexing means for obtaining  
4 parallel wavelength demultiplexing outputs from a  
5 wavelength-multiplexed input signal;

6 a plurality of dispersion compensation means for  
7 performing said dispersion compensation on the output light  
8 from said wavelength demultiplexing means;

9 a plurality of said automatic optical level  
10 adjustment means through each of which output light from  
11 the corresponding one of said dispersion compensation means  
12 is transmitted; and

13 a plurality of said light receiving means each for  
14 receiving output light from the corresponding one of said  
15 automatic optical level adjustment means.

1 18. A system according to claim 17, wherein said  
2 wavelength demultiplexing means comprises an arrayed  
3 waveguide Bragg diffraction grating type of wavelength  
4 demultiplexing device (AWG).

1 19. A system according to claim 17, wherein said  
2 wavelength demultiplexing means comprises a wavelength

3 demultiplexing device having a plurality of stages formed  
4 by optical filters using a dielectric multilayer film.

1 20. A system according to claim 17, wherein said  
2 wavelength demultiplexing means comprises a device having a  
3 plurality of stages each formed of a combination of a fiber  
4 grating and an optical circulator.

1 21. A system according to claim 20, wherein said  
2 optical circulator has three terminals.

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